



National Certificate of Educational Achievement  
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA



## Internal Assessment Resource 2012

### Digital Technologies Level 1

This resource supports assessment against:

Achievement Standard 91080 v1

Demonstrate understanding of the common components of  
basic digital infrastructures

**Resource title: Know Basic Computer Systems**

3 credits

Student Name:.....

*I declare that the material I have submitted for this unit or achievement standard is my own work and that I had no outside help from others in completing it.*

..... (student to sign)

Comments: .....

.....

☐ Not Achieved   ☐ Achieved   ☐ Merit   ☐ Excellence

#### DEPARTMENT USE ONLY

Internal Moderation Grade: \_\_\_\_\_ Signed: \_\_\_\_\_ Date: \_\_\_\_\_

*If your grade differs from the mark given by the teacher, fill in the 'internal moderation' report.*

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## Student instructions

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### Introduction

This assessment activity requires you to demonstrate an understanding of:

- the common individual components of basic computer systems, their purposes, their typical connections, and how data flows between them
- procedures and protocols for installing or replacing a physical component or a program
- the key characteristics used to specify each kind of component, in terms of interoperability, tradeoffs, efficiencies, cost, and context of use.

This is an **individual assessment** activity however the investigation can be completed in pairs or individually. **Choose one** of these to demonstrate your knowledge:

1. A written **report**
2. A slideshow **presentation**
3. **Display board**

You have **4 weeks** in-class and out-of-class time to complete your report. The report must be submitted for marking by **Friday the 7<sup>th</sup> of September**. Due to the nature of the task, there will be no re-assessment opportunity for this standard.

### Investigation

Working in pairs or small groups, find out about the common components of a basic computer system.

1. Select one of the following purposes for using a basic computer system:
  - common uses, such as word-processing and accessing email or the Internet
  - gaming, for example, getting high-speed access to the Internet
  - video editing, for example, using high-definition digital video and including audio
2. Choose a basic computer system to investigate and discuss how this meets the chosen purpose and contains all the components listed in Resource A below.
3. Gather information about:
  - the characteristics and purpose of each component
  - the connections between the components and how data flows between components
  - how the purposes of the components determine the connections between them and the typical flow of data along them
  - key characteristics used to specify each kind of component (in terms of interoperability, tradeoffs, efficiencies, cost, and context of use)
  - the characteristics (including mode, rate, and direction) and the limitations of the connections that carry data between components
  - procedures and protocols for installing or replacing a program or a physical component

## Task

Choose one of the following purposes for a basic computer system:

1. Internet browsing and word processing OR
2. Gaming OR
3. Video editing

Write a **report, presentation or display board** that **describes**...

1 - What the user will mainly **use** your basic computer system for and the **components** needed for this use (*Refer to PC, Peripheral and System software below*)

2 - The **purposes** of the following components, their **typical connections**, and how **data flows** between them:

### PC Hardware -

Case	Power supply	Motherboard
Onboard video, USB and NIC	CPU	Memory
Hard drive		

### Peripherals –

Keyboard and Mouse	CRT and LCD screens	Printer
Modem	Scanner	Speakers

### System software –

Operating system	Device Drivers	Disk Utilities
Malware/Virus Checkers		

3 - Key **characteristics** of a range of components that **limit** their **interoperability** and explain **how** they limit it

4 - The steps in a **procedure** for installing a physical component or a program, for example, **installing a driver**.

It should also **explain**...

5 - How the different purposes of the components determine the connections between them and how data typically flows along them

6 - Why it is important to follow procedures and protocols

It should **compare and contrast**...

7 - **Characteristics** and **limitations** of the connections that carry data between the components of the computer system

8 - Key characteristics used to specify each kind of component in terms of:

**Interoperability** - *e.g. comparing USB1 with USB2 and USB3. "This type of component will not operate with this, so my choice is limited to ..."*

**Tradeoffs** - e.g. *USB1 is acceptable, even though you could install USB3, but you wouldn't get a better performance for installing USB3. This will meet my needs for gaming but will limit other uses.*

**Efficiencies** - e.g. *comparing and contrasting a USB3 device with a USB1 device (data throughput)*

**Cost** - e.g. *USB2 exists on the motherboard versus the cost of an add-on USB3 card. I could choose this component because it is cheaper, but the quality of output may be less.*

Hand the following to your teacher:

- **Written report, presentation or display board**
- Any annotated diagrams, photographs, or drawings as appropriate
- **Bibliography** acknowledging your sources, fully and accurately

## Assessment schedule: Digital Technologies 91080 Know Basic Computer Systems

Evidence/Judgements for <b>Achievement</b>	Evidence/Judgements for Achievement with <b>Merit</b>	Evidence/Judgements for Achievement with <b>Excellence</b>
<p>Student has <b>demonstrated understanding</b> of the common components of basic digital infrastructures.</p> <p>They have described, and identified the purpose of the components of basic digital infrastructures (PC).</p> <p>For example, their writing includes:</p> <p><i>network interface card – purpose: to enable the computer to communicate with other computers across a network.</i></p> <p><i>display adapter interface – purpose: to provide text and graphics output to a video monitor.</i></p> <p>They have described the typical connections and data flow between components of a basic digital infrastructure.</p> <p>For example, their writing includes:</p> <p><i>Serial connection – the transmission from computer to computer or computer to peripheral one bit at a time.</i></p> <p><i>Parallel connections – the transmission from computer to computer or computer to peripheral where all the bits that make up a character are transmitted at the same time over a multiline cable.</i></p> <p>They have described the key characteristics of components of a basic</p>	<p>The student has <b>demonstrated in depth understanding</b> of the common components of basic digital infrastructures.</p> <p>They have explained how the purpose of components determines the connections between components and the typical flow of data along them.</p> <p>For example, their writing includes:</p> <p><i>For the NIC (<b>component</b>): how the communication speed (data throughput) of the operation of applications over the NIC is affected by the transmission speed (10Mbps vs 100Mbps vs 1Gbps), the transmission media (<b>characteristic</b>) (copper vs fibre, wireless, and optical, etc.), and the transmission protocols (<b>characteristic</b>).</i></p> <p><i>For example, low transmission speeds (<b>characteristic</b>) are acceptable for text-based communication (<b>purpose</b>) such as email (10Mbps); medium transmission speeds are required for feature-rich web pages (<b>purpose</b>) (100Mbps) such as flash applications; fast transmission speeds (1Gbps) provide a better experience, e.g., for viewing high definition video or multi-player video gaming (<b>purpose</b>). As a comparison, if we tried to view high definition video over a 10Mbps link, the viewing experience would show</i></p>	<p>The student has <b>demonstrated comprehensive understanding</b> of the common components of basic digital infrastructures.</p> <p>They have discussed the characteristics and limitations of the connections that carry data between components.</p> <p>For example, their writing includes:</p> <p><i>Copper (CAT5 or better) has a maximum single step transmission path of 100 metres before a repeater is required to enhance the signal (e.g., another switch).</i></p> <p><i>Fibre in comparison has a single step path, in most cases of 3 or more km.</i></p> <p>They have discussed the key characteristics used to specify each kind of component in terms of interoperability, tradeoffs, efficiencies, cost, and context of use.</p> <p>For example, their writing includes:</p> <p><i>On-board video is often not of high enough quality and performance for (e.g.) a multi-player, high-definition video game, which would require an additional high definition video card with an on-board graphics processor and additional video RAM.</i></p> <p><i>The choice is now do you install a high</i></p>

<p><b>digital infrastructure that limit their interoperability.</b></p> <p><i>For example, the student has described the key characteristics of on-board video versus AGP (the relative performance characteristics).</i></p> <p><i>Key characteristics of USB</i></p> <p><i>A USB is a high speed serial connection standard for peripheral devices. USB1 has a data transfer rate of 12MBps, USB2 has a data transfer rate of 480Mbps, USB3 has a data transfer rate in excess of 3.2Gbps.</i></p> <p><i>The advantages of USB are that it is simple, in comparison to older serial devices, that it is self powering and that multiple devices can be connected to one USB.</i></p> <p><b>They have described a procedure or protocol for installing or replacing a physical component or a program.</b></p> <p><i>For example, the student has written a clear set of instructions, well stepped out, for installing or replacing a physical component or a program.</i></p> <p><i>This description relates to only part of what is required, and is indicative only</i></p>	<p><i>considerable latency, with slow loading and the video frame jerky, and in some instances, it may crash the link.</i></p> <p><b>They have explained how the key characteristics of components limit their interoperability.</b></p> <p><i>For example, their writing includes:</i></p> <p><i>Limitation – multiple users on a single wireless link will lower the bandwidth available for an individual user.</i></p> <p><i>USB protocol improves on the old serial protocol (60Bps/RS232) and enables much higher data transfer rates (<b>characteristic</b>).</i></p> <p><b>They have explained the importance of procedures and protocols when installing or replacing a physical component or a program.</b></p> <p><i>For example, their writing includes:</i></p> <p><i>These are important for consistency and accuracy, so that where there is more than one user or service person. Everyone can understand how to manage the computer system.</i></p> <p><i>This description relates to only part of what is required, and is indicative only</i></p>	<p><i>definition video card or accept the lower quality of the video output for a lower \$ cost of the computer?</i></p> <p><i>The use of on-board video lowers the quality of the user experience when compared with that given by a high def. video card (with its own graphics processor and RAM) and has an additional impact on other system resources such as processing and RAM.</i></p> <p><i>This description relates to only part of what is required, and is indicative only</i></p>
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Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.